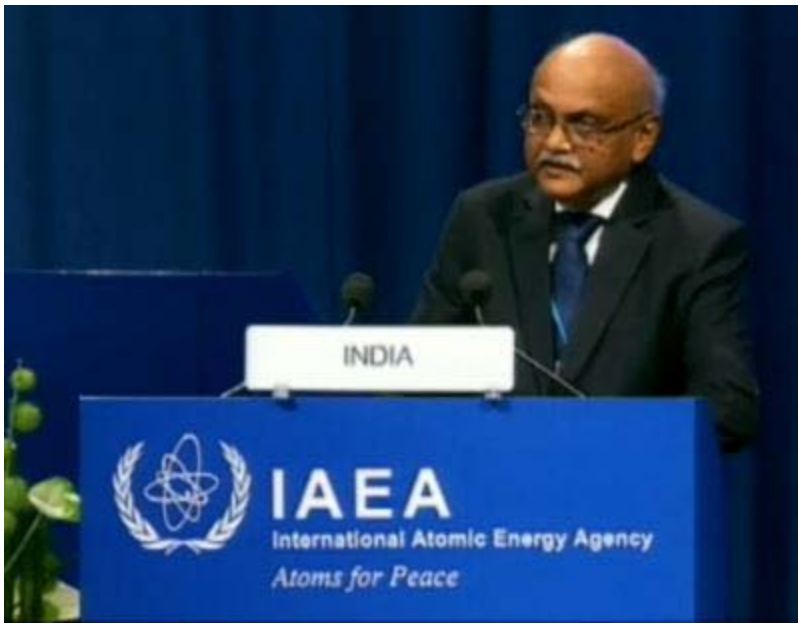

International Atomic Energy Agency

57th General Conference, Vienna,
18 September 2013

Statement by Dr. Ratan Kumar Sinha,
Chairman of the Atomic Energy Commission
and
Leader of the Indian Delegation

Mr. President, Excellencies, Ladies and Gentlemen,

It gives me great pleasure to congratulate you, Mr. President, on your election as the President of the 57th General Conference. Under your able leadership, I am sure the current General Conference will accomplish all the tasks before it.

India congratulates His Excellency Mr. Yukia Amano on his unanimous election for a second term as Director General of the IAEA. I am sure that the Agency and the international community will benefit from his experience and foresight.

India welcomes the new Members to the IAEA and I take this opportunity to congratulate Brunei Darussalam and the Commonwealth of the Bahamas on the occasion of their joining the IAEA family.

Mr. President,

We are meeting now after two important meetings related to nuclear energy, namely, the Fukushima Ministerial Conference in Japan during December 15-17, 2012, and the IAEA International Ministerial Conference on Nuclear Power in the 21st Century in the Russian Federation during June 27-29, 2013. Both these meetings have underscored the role that nuclear energy continues to play in the energy mix of various countries for achieving energy security and sustainable development goals in the 21st century for their respective populations. The international community has learned its lessons from the Fukushima Daiichi accident and come out with new guidelines for further enhanced levels of safety of nuclear reactors against beyond- design-basis accident scenarios.

India is committed to implement the highest standards for the safety of Indian nuclear power plants and the associated fuel cycle facilities. India will continue to participate and assist the IAEA Secretariat in its endeavour to enhance nuclear safety through the cluster of measures it has formulated in the IAEA Action Plan on Nuclear Safety. In this connection, I wish to inform you that the first IAEA Operational Safety Review Team (OSART) mission to India for Rajasthan Atomic Power Station (RAPS) units - 3&4, took place during October 29 to November 14, 2012. A follow-up OSART mission is planned in 2014. Preparation and planning for inviting IAEA's Integrated Regulatory Review Service (IRRS) for peer review of our regulatory system is also in progress, and India will approach the Agency in due course with a request to undertake this mission.

Further, as I had informed last year, India, along with the IAEA, organised an International Workshop on "Safety of Multi-Unit Nuclear Power Plant Sites against External Natural Hazards" at Mumbai, during October 17-19 2012. The Workshop addressed the complex task of safety evaluation of a multi-unit site with respect to multiple hazards, such as earthquake, tsunami and fire. The Workshop was attended by experts from regulatory authorities and plant operators from different countries as well as the IAEA. Actions taken by Member States and International Organisations following Fukushima Accident were also discussed.

Mr. President,

I now turn to updating on India's progress in the three-stage nuclear power programme, formulated under the visionary leadership of Dr. Homi Jehangir Bhabha. India has adopted the policy of a closed nuclear fuel cycle in order to extract the maximum energy from the limited uranium resources, to ensure sustainable nuclear waste management, and above all, to achieve sustainable, long-term energy security through utilisation of thorium.

The performance of the Indian nuclear power plants (NPPs), as well as of the several fuel cycle facilities, reached their highest levels last year. This includes NPPs registering 80% capacity factor, PHWR fuel production of 812 MT (an increase of 8% over the previous year), and the highest ever production of heavy water with the lowest specific energy consumption.

The average annual availability of the Indian NPPs has remained at 90%. Six of the nineteen reactors, currently under operation in the country, have logged continuous operation of more than 300 days during the year. The Indian nuclear power sector has registered over 379 reactor years of safe operation. In this connection, I would like to once

again reiterate that the Indian Pressurised Heavy Water Reactors (PHWRs) offer a highly competitive capital cost per MWe and a low unit energy cost.

I am happy to inform you that the first unit of the Kudankulam Nuclear Power Plant achieved its first criticality on July 13, 2013, and is expected to begin commercial operation shortly. This plant has been built in cooperation with the Russian Federation. The second unit is also in an advanced stage of commissioning.

The construction of four indigenously designed 700 MWe PHWRs, two each at existing sites of Kakrapar in Gujarat and Rawatbhata in Rajasthan, is progressing on schedule, and India is planning to construct sixteen more PHWRs of 700 MWe at five different inland sites.

The construction of the 500 MWe Prototype Fast Breeder Reactor (PFBR) is nearing completion at Kalpakkam. The critical erection of all permanent in-core components has been completed. Filling of sodium in the secondary sodium loop is planned shortly, and PFBR is expected to achieve first criticality in about a year from now.

A co-located Fast Reactor Fuel Cycle Facility (FRFCF), to reprocess and re-fabricate the fuel from PFBR, is being set up at Kalpakkam. Necessary site infrastructure has already been created and preparations for launching the Project are being taken up.

The Fast Breeder Test Reactor (FBTR), fuelled with unique mixed carbide fuel, located at the Indira Gandhi Centre for Atomic Research (IGCAR) has been performing well with high availability factor, providing valuable operating experience, as well as technical inputs to India's fast reactor programme. Irradiation of indigenously fabricated sodium bonded metallic fuel pins has been initiated in this reactor.

India continues to carry forward intense development of Thorium fuel cycle based technologies for demonstration in its AHWR programme. It is heartening to note that one of the Panel Sessions at the IAEA International Ministerial Conference on Nuclear Power in the 21st Century held at St. Petersburg was devoted to the topic 'Drivers for deployment of sustainable and innovative technology'. In this Session, I had the opportunity to share India's rich experience in the development and implementation of Thorium utilisation programme. Thorium-based fuel cycles and technologies present opportunities for enhanced passive safety features, utilisation of the larger natural resources of Thorium, and inherent proliferation resistance. International collaboration under the IAEA would help provide a much wider resource base for future nuclear technology development in this direction.

Mr. President,

India has continued to make good progress in finding new uranium resources in the country through extensive exploration work using multiple technologies. As a result of the use of advanced techniques, we have been able to identify new resources of Uranium. Last year, our reserves have registered an increase of about five percent.

The Nuclear Fuel Complex has developed a new process route, based on adopting radial forging for extrusion of blanks, to manufacture pressure tubes with improved metallurgical properties leading to better creep performance.

Considering India's domestic strength in nuclear power and non-power applications, India continues to host events in support of many programmes of the IAEA. An IAEA Technical meeting on Advanced Fuel Cycles for PHWR was held in India during April 8-11, 2013. In this Meeting, twenty one papers were presented covering the areas of new fuel cycle, fuel design, performance, post irradiation examination and accident modeling. An IAEA Inter-regional training course on "Uranium exploration and processing techniques" was hosted by the Uranium Corporation of India Limited at Jamshedpur. Delegates from twenty three countries participated in this Course.

India, as a founder Member of IAEA's International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO), appreciates the significant progress made by INPRO over the years. The INPRO methodology for assessment of innovative nuclear reactors and fuel cycles provides a broad framework for developing specific goals and acceptance criteria for new designs. India continues to support INPRO, and will be making a voluntary contribution of US $50,000 later this year.

Mr. President,

The impact of nuclear power in addressing climate change concerns needs to be emphasised, since nuclear power involves low greenhouse gas emissions. In this direction, the decision of the Director General to organise the Scientific Forum on the theme of Nuclear Applications for a Sustainable Marine Environment during this session of the General Conference, is quite relevant.

India is developing technologies for high temperature reactors and hydrogen production processes. The current R&D activities target technologies for high temperature nuclear reactors, capable of supplying process heat up to 1000°C, and high efficiency hydrogen production processes, such as thermo-chemical processes and high temperature steam electrolysis. In addition, India is also developing hydrogen storage materials, as well as fuel cells for applications in transport and power generation sectors. As a contribution to the IAEA activities related to nuclear hydrogen production, a software tool for Hydrogen Economic Evaluation Programme (HEEP) has been developed by an Indian team under a contract with the IAEA. This tool is being used for economic analysis of nuclear hydrogen production so as to compare various options.

Non-power applications of nuclear and radiation technologies in the area of health-care, water, industry and environmental protection are extremely important. We have been a strong supporter and contributor to the Regional Cooperation Agreement (RCA) initiatives right from its inception, and India is the RCA Lead Country in the area of industrial applications and cancer treatment for the past several years.

The Tata Memorial Centre (TMC), an autonomous institution under the Indian Department of Atomic Energy, continues to play a major role in developing cost-effective methods for cancer diagnosis and treatment. TMC has developed a low-cost screening method for cervical cancer using acetic acid. In a recently published study carried out over twelve years covering 150000 women, it has been shown that the use of this technique has resulted in reducing mortality by 31%.

The Bhabha Atomic Research Centre (BARC) has developed a Digital Radiotherapy Simulator (DRS) “Imagin” as a vital supplement to the indigenous teletherapy system, Bhabhatron. One of the three DRS Units installed at TMC was inaugurated remotely by the DG, IAEA during his visit to India in March this year. The technology of DRS has been transferred to private industry for its wider deployment.

India is highly appreciative of the IAEA’s efforts in cancer management, and in particular the Programme on Action for Cancer Therapy (PACT).

India has been offering education and training programmes for physicians and technologists in the field of nuclear medicine. The Radiation Medicine Centre (RMC) of BARC in Mumbai leads these efforts, including those under various IAEA programmes. In early September this year, the RMC completed fifty years of sustained service in the field of nuclear medicine. RMC-trained specialists are not only serving in centres all over India, but also in several other countries.

Mr. President,

In addition to the various core activities related to nuclear energy and non-power applications, India is engaged in the development of high technologies in several other areas, including nuclear fusion and particle accelerators.

India has an active programme in nuclear fusion. The Steady State Superconducting Tokamak (SST-1) at the Institute for Plasma Research (IPR) has been successfully commissioned with the first plasma obtained on June 20, 2013. With this achievement, India has joined the select group of countries where research in `Superconducting Tokamak’ is currently being carried out. As a partner in the ITER Project, India is also working on the development of the concepts for Test Blanket Module (TBM). The Indian Lead-Lithium Ceramic Breeder Test Blanket Module will be tested in the ITER machine. The Indian TBM team is involved in the indigenous development of tritium breeder material by solid state reaction and solution combustion methods, as well as in the characterisation of these materials.

The Indus-2 Synchrotron Radiation Source at Indore operated at an enhanced current of 158 mA at 2.5 GeV using indigenously developed solid state Radio-Frequency amplifier modules. An indigenously designed and developed Radio Frequency Quadrupole (RFQ) has been commissioned at BARC and a proton beam was successfully accelerated to 200 keV through the RFQ. This is part of the R&D for India’s roadmap of Accelerator Driven Systems (ADS). As a part of our accelerator development programme, and also as Indian contribution under an international collaboration initiative, a prototype non-invasive Beam Position Monitor for use in GANIL accelerator facility in France, has been developed and tested in France.

Mr. President,

India actively participated in the IAEA International Conference on Nuclear Security at Vienna during July 1-5, 2013.

India has signed an Arrangement with the IAEA concerning its voluntary contribution to the

Nuclear Security Fund. During the last year, we have identified activities to be taken up with the IAEA and look forward to holding the first activity - “Review of Guiding Principles on applying Computer Security Controls to Instrumentation & Control Systems at Nuclear Facilities" during September 23-27, 2013. This activity will be held under the aegis of the Global Centre for Nuclear Energy Partnership (GCNEP), being established near Delhi. Off-campus activities of GCNEP are taking place, involving organisation of different training programmes. Recently, a National Programme on Prevention and Response to Radiological Threats was organized during August 26-30, 2013 at GCNEP. During the current year, two other programmes, one on Food Irradiation, and the second on Radiological Safety, were organised.

Mr. President,

To conclude, I would like to look ahead at the world energy scenario beyond 2050. By then the accessibility and affordability, if not the global availability, of the fossil fuels will decline. Other energy sources, including nuclear, will need to bridge this deficiency so as to ensure clean and sustainable energy supply for different sectors, and at various scales. This would, in turn, necessitate a more rational approach and strategy, seeking a well-balanced use of all the energy resources available to us. Apart from electricity, nuclear will need to address the large-scale energy needs for industrial use and transport as well. In this context, ten years ago, the IAEA Scientific Forum had discussed the rising hydrogen economy, including the fuel's future production by advanced next generation nuclear power plants. The IAEA’s latest Nuclear Technology Review is now carrying a feature article on, ‘Nuclear Hydrogen Production Technology’.

Considering the long gestation period for deployment of new technologies in the nuclear field, it is essential to further strengthen the role of the Agency for facilitating pooling of international knowledge resources, to achieve sustainable energy security at the global level, looking at the challenges of the future.

Thank you, Mr. President.